find that the field contained stars of the 10th and 11th magnitude only. One star in particular attracted my attention: it was extremely faint, and could only be observed with great difficulty. By clamping the lower circle I measured the difference of Right Ascension between this star and θ *Scorpii* and σ *Aræ*, the difference of North Polar Distance being obtained from the readings of the declination circle. These comparisons gave the following position for the faint star:—R.A. = $17^h\ 30^m\ 21^s$; N.P.D. = $135°\ 23'$. The star was observed on the 13th, 14th, and 17th instant. Although there are several other faint stars within a few minutes of arc of this one, it is extremely probable that the star thus observed is identical with the star of the fifth magnitude by which the positions of *Brisbane* 5754 and 5799 were determined on the 4th, 5th, 6th, and 9th October 1862. The nebula seen in the same field of view with it is undoubtedly No. 3690 of Sir J. Herschel's Cape Catalogue for 1830. As the Variable is a remarkable one, I propose, when the Moon's absence allows the stars to be more readily seen, to record the positions of all the stars embraced in the same field of view.

Windsor, N. S. Wales,
November 21, 1877.

Improvements in a Solar Spectroscope, made by Mr. Grubb for Professor Young. By Wentworth Erck, Esq.

The usual practice in observing with the spectroscope, I believe, is to adjust the collimating and observing telescopes so as to render the incident and emergent pencils parallel for rays of mean refrangibility; and, on observing at either end of the spectrum, then to readjust the eye-piece of the observing telescope so as to render the emergent pencil parallel.

But this mode of procedure will not give the best definition, which requires that each pencil—that is to say, the pencil first incident on the first prism, as well as the pencil after dispersion—should be strictly parallel; and this adjustment of two variables can scarcely, so far as I am aware, be made while the spectroscope is in position.

Now, in the improved spectroscope alluded to, the collimating and observing telescopes are placed close together and parallel to each other, so that the observing telescope shall receive the rays after two internal total reflections.

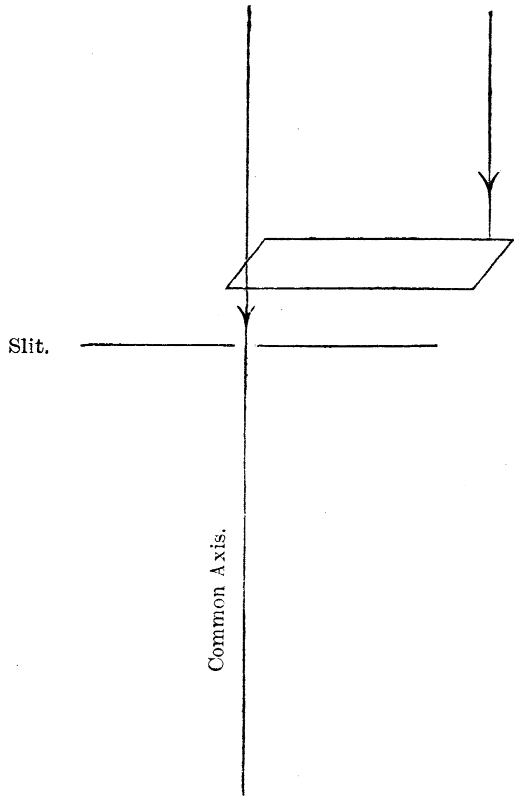
In this position the eye-piece of the observing telescope and the collimating lens are coupled together by rack-work, so that both move together by turning one pinion; and thus, after the first adjustment, the two pencils are rendered strictly parallel for all parts of the spectrum.

The power varies from 1 to 10 prisms of 60°.

The second improvement is in the mode of sweeping round the disk of the Sun.

It is not desirable to turn a heavy, complicated, and delicately adjusted instrument upside down, and into every conceivable position: there is great risk of the adjustments being injured by the flexure.

In the new spectroscope the axis of the collimating telescope is made to coincide accurately with the axis of the great telescope; the edge of the disk is then brought opposite the slit by the rotation of a small parallelopipedon of glass whose length is equal to the radius of the disk.



Thus the parallelopipedon alone rotates, while the spectroscope remains stationary.

Thirdly—The exact coincidence of the axes of the great telescope and the collimating telescope is obtained by mounting the spectroscope on a strong steel bar firmly attached to the great telescope, with a suitable adjustment between the bar and the spectroscope.